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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/941,112  | 08/28/2001  | Blair Wyman          | ROC920010120US1     | 5881             |
| 7590  | 05/23/2005  |                      | EXAMINER            |                  |
| Grant A. Johnson<br>IBM Corporation - Dept. 917<br>3605 Highway 52 North<br>Rochester, MN 55901 |             |                      | WOZNIAK, JAMES S    |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2655                |                  |

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/941,112             | WYMAN, BLAIR        |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | James S. Wozniak       | 2655                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 20 December 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-20 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 December 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Response to Amendment***

1. In response to the office action from 9/20/2004, the applicant has submitted an amendment, filed 12/20/2004, amending the specification, drawings, and Claims 1, 5-8, 11, 15, and 18-19, while arguing to traverse the art rejection based on the limitation regarding the storing of command start and length times, channel number, and respective speech recognition units (*Amendment, Page 18*). Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments. The applicant's arguments with respect to Claim 15 have been fully considered but are moot with respect to the new grounds of rejection in view of Namba et al (*U.S. Patent: 5,884,249*).

2. Based on the amendments to the drawings, specification, and claims the examiner has withdrawn the previous objections directed towards minor informalities regarding the misuse of the term "voice recognition."

***Response to Arguments***

3. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to **Claims 1 and 15**, the applicant argues that Byers (U.S. Patent: 6,219,645) fails to teach a stored channel number (*Amendment, Page 18*), however, Byers teaches a database that stores microphone channel data that includes a identifying number and location coordinates (*Col. 9, Lines 47-61; microphone channels, Fig. 6, Element 620*).

The applicant further argues that Byers fails to teach storing command start and length times, however it is the combination of Byers and Gerson et al (U.S. Patent: 4,905,288) that provides this teaching. Byers teaches recording sound information detected by each microphone (Col. 12, Lines 9-12) and a command start time (*first detecting a command at a microphone, Col. 13, Lines 22-25*), although it could be considered inherent that each of these commands would have a starting point in time and a particular duration in time as shown by stored template data to which a speech command is compared in Fig. 5, Gerson has been provided to more clearly point out this particular limitation. Gerson teaches the use of speech endpoints (*Col. 26, Lines 14-16*), which would also provide information on speech command duration as a difference between endpoints. Byers utilizes sound information retrieved from a microphone including a command start (*arrival of a command*) time and microphone channel data (Col. 12, Lines 4-43) to determine a sound location vector, while Gerson teaches the specific use of speech endpointing which would provide the benefit of isolated command word recognition, thus allowing the system to properly recognize individual commands and determine a sound location vector for each command word.

The applicant's argument with regards to respective speech recognizers corresponding to each microphone have not been recited in claim 1, and thus, is moot. As for **Claim 15**, the

applicant is directed to the below rejection utilizing the teachings of Namba et al (*U.S. Patent: 5,884,249*).

With respect to **Claim 11**, see the response regarding claims 1 and 15. In addition, the applicant argues that Byers in view of Gerson fails to teach identifying a received speech signal for a predetermined person and identifying the spoken commands only from that person, however Gerson teaches speaker dependent recognition which only allows for the recognition of a command from a specific identified registered speaker (*Col. 7, Lines 24-55*). Moreover the teaching of a computer readable medium was rejected on the basis of official notice (prior office action, Page 6), which has not been challenged by the applicant. Gerson has not been relied upon to provide such a teaching, thus the below rejection is considered to be a sufficient response to such an argument.

As per the applicant's arguments regarding the use of a clock adder (*Amendment, Page 21*), the examiner points out that this feature is inherent with the ADCs taught by Byers for the synchronized processing of multiple output digital signals (*prior office action, Page 4*).

The dependent claims are argued as further limiting their rejected parent claims (*Amendment, Page 21*). Thus, these claims are also rejected.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Byers (U.S. Patent: 6,219,645) in view of Gerson et al (U.S. Patent: 4,905,288).

With respect to **Claim 1**, Byers discloses:

Receiving a microphone signal from each of a plurality of microphones (*Col. 5, Lines 2-12, and Fig. 1, Elements, 70, 75, 80, and 85*);

Identifying a spoken command utilizing speech recognition responsive to each said received microphone signal (*automatic speech recognition controller, Col. 5, Lines 2-12*);

Storing a command start time and a channel number for corresponding to one of the plurality of microphones (*Col. 9, Lines 47-61; Col. 12, Lines 4-43*).

Identifying a sound location vector responsive to each said identified spoken command utilizing command start time, start length, and channel number (*determining speaker direction, Col. 5, Lines 2-29, and Col. 12, Lines 30-36, Col. 12, Lines 4-43*); and

Providing a response command based upon said sound location vector (*relaying a speech command to an appropriate device to produce a desired response, Col. 5, Lines 2-29, and speech commands, Col. 10, Lines 25-43*).

Byers does not teach the use of a command length in the sound location vector recognition process, however Gerson recites:

Storing a command start time T.sub.0, and command length T.sub.c (*speech input endpoints, Col. 9, Line 56- Col. 10, Line 4, and Col. 26, Lines 14-16*).

Byers and Gerson are analogous art because they are from a similar field of endeavor in speech-controlled systems. Thus, it would have been obvious to a person of

ordinary skill in the art, at the time of invention, to combine the use of endpoints in determining a command starting and ending point as taught by Gerson with the speech control system capable of identifying a speaker's location for routing a command to an appropriate device and microphone identifier for specifying a microphone location as taught by Byers to increase recognition accuracy for the single word commands and initialization words taught by Byers (*Col. 5, Line 60, and Col. 16, Lines 29-40*) by performing isolated word recognition using endpoints. Therefore, it would have been obvious to combine Gerson with Byers for the benefit of increasing recognition accuracy for single word commands and initialization words.

With respect to **Claim 2**, Byers recites:

Digitizing said microphone signal from each of a plurality of microphones; and adding a clock signal to each said digitized microphone signal (*analog to digital converter, Col. 6, Lines 20-50, and a plurality of ADCs coupled to a digital signal processor, Col. 6, Line 63- Col. 7, Line 13, and Fig 2, Element 230, that would inherently contain an internal clock for synchronized processing of multiple digital signals*).

With respect to **Claim 3**, Byers shows:

Applying an analog audio signal from each of a plurality of microphones to a respective analog-to-digital converter (ADC) coupled to each of said plurality of microphones (*Fig. 2, Elements 220 and 225*).

With respect to **Claim 4**, Byers discloses:

Applying a digitized audio signal from said respective analog-to-digital converter (ADC) to a clock adder for adding said clock signal (*plurality of ADCs coupled to a digital signal*

*processor, Col. 6, Line 63- Col. 7, Line 13, and Fig 2, Element 230, that would inherently contain an internal clock for synchronized processing of multiple digital signals).*

With respect to **Claim 5**, Byers recites:

Identifying a predefined first command word of predetermined spoken commands (*recognizing an initialization word prior to a command, Col. 16, Lines 29-40*).

With respect to **Claim 6**, Byers teaches the speech control system and method capable of identifying a speaker's location for routing a command to an appropriate device, as applied to Claim 1. Byers does not teach the use of speaker dependent recognition, to recognize commands only for a specific user, however speaker dependent recognition is well-known in the speech recognition art, as is evidenced by Gerson:

Identifying said received microphone signal for a predetermined person and identifying said spoken commands only from said identified predetermined person (*speaker dependent recognition, Col. 7, Lines 24-55*).

Byers and Gerson are analogous art because they are from a similar field of endeavor in speech-controlled systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the use of speaker dependent recognition in a speech-controlled system as taught by Gerson with the speech control system capable of identifying a speaker's location for routing a command to an appropriate device as taught by Byers to allow only specific users to issue a speech command, thus preventing incorrect command recognition resulting from an unregistered user's speech or background audio device. Therefore, it would have been obvious to combine Gerson with Byers for the benefit of preventing unauthorized users from issuing a command through the use of speaker dependent recognition.

With respect to **Claim 7**, Byers teaches the recognition of a keyword sequence as applied to Claim 5, while Gerson teaches the use of speaker dependent recognition as applied to Claim 6.

With respect to **Claims 8 and 9**, Byers teaches the analysis of a digital signal at a central recognition processor in order to determine a sound location vector (*Col. 7, Lines 28-48*).

With respect to **Claim 10**, Byers discloses:

Determining intent of said identified spoken command utilizing said sound location vector (*determining speaker direction, Col. 5, Lines 2-29, and Col. 12, Lines 30-36, and Col. 6, Lines 16-18*).

With respect to **Claim 11**, Byers teaches the speech control method capable of identifying a speaker's location for routing a command to an appropriate device, as applied to Claim 1. Byers does not specifically suggest method implementation as a computer program on a computer readable medium, however, it would have been obvious to one of ordinary skill in the art, at the time of invention, to store the speech control method taught by Byers as a program on a computer readable medium to increase method compatibility and usability by providing a means for method use with multiple computer systems.

Also, Gerson provides the teaching of speaker dependent recognition as applied to Claim 6.

In regards to **Claim 12**, see the rejection with respect to Claim 1.

With respect to **Claim 13**, Byers discloses the DSP used for speech recognition as applied to Claim 2, a microphone identifier as applied to Claims 1 and 11, and the use of arrival times in determining user location (*Col. 12, Lines 30-36, and Col. 13, Lines 15-31*), while

Gerson discloses the use of endpoints in a speech recognition process as applied to Claims 1 and 11.

**Claim 14** contains subject matter similar to Claim 10, and thus, is rejected for the same reasons.

6. **Claims 15-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Byers in view of Gerson, and further in view of Namba et al (*U.S. Patent: 5,884,249*).

With respect to **Claim 15**, Byers in view of Gerson teaches the speech control method capable of identifying a speaker's location for routing a command to an appropriate device, as applied to Claim 1. Byers also teaches the use of a central processing device as applied to Claim 8. Byers in view of Gerson does not teach a respective speech recognition unit couple to each one of a plurality of microphones, however Namba teaches the use of a speech recognizer at every speech input to a speech controlled system (Col. 20, Lines 1-19).

Byers, Gerson, and Namba are analogous art because they are from a similar field of endeavor in speech-controlled systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Byers in view of Gerson with the use of a speech recognizer at every speech input to a speech controlled system as taught by Namba in order to provide more recognition processing of speech commands in a system having a plurality of inputs (*Namba, Col. 1, Lines 54-61*).

**Claim 16** contains subject matter similar to Claim 3, and thus, is rejected for the same reasons.

**Claim 17** contains subject matter similar to Claim 4, and thus, is rejected for the same reasons.

**Claim 18** contains subject matter similar to Claim 7, and thus, is rejected for the same reasons.

**Claim 19** contains subject matter similar to Claim 8, and thus, is rejected for the same reasons.

**Claim 20** contains subject matter similar to Claims 1 and 10, and thus, is rejected for the same reasons.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Everhart (*U.S. Patent: 6,230,138*)- teaches a system utilizing multiple speech recognizers and a plurality of microphones.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached at (703) 305-4827. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak  
4/7/2005



DAVID L. OMETZ  
PRIMARY EXAMINER